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Scientific and Technical Subcommittee
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REPORT ON THE UNITED NATIONS/INTERNATIONAL ASTRONAUTICAL FEDERATION WORKSHOP ON ORGANIZING SPACE ACTIVITIES IN DEVELOPING COUNTRIES: RESOURCES AND MECHANISMS, ORGANIZED IN COOPERATION WITH THE GOVERNMENT OF AUSTRIA

(Graz, 15-17 October 1993)

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INTRODUCTION

A. Background and objectives

1. The present report contains a summary of the proceedings of the United Nations/International Astronautical Federation Workshop on Organizing Space Activities in Developing Countries: Resources and Mechanisms, and the conclusions and recommendations that were adopted during the course of the Workshop. The Workshop was organized by the Office for Outer Space Affairs of the United Nations as part of its activities. The Workshop was recommended by the Scientific and Technical Subcommittee on the Peaceful Uses of Outer Space and included in the Programme on Space Applications, which was subsequently endorsed by the Committee and by the General Assembly, in its resolution 49/46.

2. The Workshop was co-sponsored by the Commission of the European Communities and the European Space Agency (ESA) and hosted by the Austrian Space Agency on behalf of the Government of Austria. It was held at Graz from 15 to 17 October 1993.

3. The Workshop began immediately prior to the 44th International Astronautical Federation Congress, which was held at Graz from 16 to 22 October, in order to enable Workshop participants to attend the Congress.

4. The objective of the Workshop was to allow the 40 funded participants from different countries to exchange information on the applications of space technology and to address either institutional or commercial examples of space research, development or applications that could serve as models for initiating space activities in developing countries.

5. The Workshop reviewed the recommendations of two earlier workshops in the series and addressed, within the central topics of (a) environmental and resource management and (b) space communications for development, the technological needs of and the resources and mechanisms through which the developing countries could initiate or strengthen their own space-related activities. The experiences of various countries in the development and use of space technologies for development purposes were presented in lectures, and the implications of those experiences for developing countries were discussed by the participants.

6. The present report, covering the background, objectives and organization of the Workshop and containing the conclusions and recommendations adopted by the participants, has been prepared for the Scientific and Technical Subcommittee. Funded participants report to the appropriate authorities in their own countries.

B. Organization and programme

7. The following Member States and intergovernmental and international organizations were represented at the Workshop: Bangladesh, Brazil, Cape Verde, Chile, China, Costa Rica, Colombia, Hungary, India, Indonesia, Iran (Islamic Republic of), Kenya, Liberia, Malaysia, Mexico, Mongolia, Morocco, Pakistan, Paraguay, Philippines, Thailand, Ukraine, Venezuela; Office for Outer Space Affairs and International Telecommunication Union (ITU); Commission of the European Communities, ESA, International Maritime Satellite Organization. Speakers and Chairmen from Austria, Canada, Germany, Italy, Netherlands, United Kingdom of Great Britain and Northern Ireland and United States of America also participated.

8. The Workshop was formally opened by P. Jankowitsch, former Chairman of the Committee and Member of the Austrian Parliament, who made the keynote speech and S. Mehmud, Chief Scientist and Scientific Adviser of the Pakistan Defence Science and Technology Organization, who made a theme speech. An opening statement was also made by the Director of the Office for Outer Space Affairs and J. Ortner,

Managing Director of the Austrian Space Agency. A welcoming statement was also made by A.Stingl, the Mayor of Graz, and by a representative of the Office of the Governor of Styria.

9. The United Nations developed the programme of the Workshop (see annex) in collaboration with the Austrian Space Agency, the International Astronautical Federation and the other co-sponsors. The Workshop was conducted through a series of plenary and working group sessions.

10. The participants expressed their appreciation to the United Nations, City of Graz, Government of Austria, International Astronautical Federation, Commission of the European Communities and ESA for organizing and hosting the Workshop, for their financial assistance and for the technical quality of the programme.

I. SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

11. In addition to attending the plenary sessions, participants divided into two working groups and developed, under the guidance of the Chairmen, a set of recommendations. The full text of these recommendations was agreed upon at the final plenary.

General

(a) It would be helpful if all countries could nominate an agency or other organization to be the national focal point for all space-related matters. This focal point needs to build and maintain regular contact with all the many potential domestic users of space services. The existence of known national focal points would significantly facilitate international cooperation.

(b) National focal points need to establish mission goals; that is to say, they should, in close consultation with those users/organizers responsible nationally, analyse and define problems where space techniques can help to provide solutions. The development of these goals is an essential step in seeking and applying international space cooperative assistance. The role of non-governmental/professional organizations can be appreciable.

(c) More cooperation between the developing countries themselves is to be encouraged. In this respect the Workshop noted with interest the mechanism known as the Asia-Pacific Multilateral Cooperation in Space Technology and Applications (MCSTAD) and expressed the hope that similar regional initiatives would be taken and given the international support they deserve.

(d) The United Nations has several important roles to play in stimulating space cooperation with developing countries, both through its Committee oN the Peaceful Uses of Outer Space and its relations with other international organizations. For example, in providing consultancies which give impartial expert advice for resolving problems with due consideration to local conditions; coordination in natural disaster prediction and relief; and helping to rationalize the creation and upgrading of ground stations for the reception of satellite data, to ensure maximum coverage and access.

(e) Decision makers in developing countries need to be shown not how impressive space achievements are, but how valuable and cost effective space techniques can be in helping to solve some of their countries' most pressing problems and how this can realistically be achieved. Decision makers must be shown that, properly applied, space can improve the quality of life of their citizens and promote economic growth.

Telecommunications

(f) Satellite communication should be introduced at least at university for graduate level, to provide the nucleus in developing countries for the exploitation of communication satellite possibilities.

(g) INTELSAT, INMARSAT, and other satcom operators should be persuaded to provide satcom capacity to foster development of services, including television programmes (leading to interactive educational programmes), data relay, fax transmissions and even video communications using VSATs.

(h) Spare capacity from satcoms including those flown by developing countries should be made available to these countries for experimental and pre-operational purposes.

(i) A second step would be the procurement of simple and inexpensive hardware with fractional transponder capacity to initiate first services within developing countries, thus providing hands-on experience and the basis for future upgradings.

(j) It is important to remember that some developing countries have developed a capability to manufacture both satcoms and ground equipment, such as TVROs and VSATs. Standardization of such equipment would be of great advantage to developing countries.

(k) Developed countries have a responsibility, in their existing and planned satcoms, to keep in mind the needs of developing countries, in particular in regard to the development of new technologies enabling frequency utilization reduction and avoidance of radio interference between satellites in the geostationary orbit. The developed countries need to lend their weight to ensuring an evenhanded approach to the allocation of frequency bands and orbital slots to ensure that developing countries are not, and will not be, disadvantaged.

Earth observation

(l) Over the last five years there has been a significant improvement in developing countries' capacity to use Earth observation space data, but considerably more could be achieved at relatively little cost if appropriate and coordinated mechanisms, including those at a national level, could be implemented.

(m) There is not a general shortage of satellite data, but potential users and decision makers are not always aware of the potential and still less of how the data can be accessed. The aim must be to make satellite data available at affordable cost and in a timely manner to all who need it, unhindered by unnecessary bureaucratic complications and free of external influences.

(n) It is essential for developing countries to provide an input to the dialogue with space agencies which is now ongoing in the framework of Committee on Earth Observation Satellites. The aim should be not only to maximize the use of existing satellites, but also to guide space agencies in preparing new space programmes.

(o) End user needs in developing countries should not be described in terms of space, e.g. orbit, type of sensor etc., but primarily in terms of the service, measurement etc. needed on the ground - in other words in terms of the end-users' problems.

(p) It is for consideration whether the existing CEOS structure can be modified to give adequate representation to end-users or whether some new international user forum is needed.

(q) A growing number of developing countries are developing satellite competence; it is to be hoped that they will direct their space expenditure towards activities which directly help to address problems in their own country and other countries with similar problems. In this way the effort can complement the existing Earth observation space programmes. Space agencies should be reminded that it is important for space data to be available to developing countries in the most user-friendly form.

(r) It is high time for the use of Earth observation space techniques to be systematically incorporated into educational curricula at several levels, not so much to train space specialists as to make other professionals space literate and to upgrade public understanding of what space can and cannot do.

(s) Remote sensing institutes should avoid becoming isolated and should actively seek cooperation and even co-location with other institutes: agriculture, fishing, geology etc.

II. PRESENTATIONS TO THE WORKSHOP

12. Several papers were presented to the Workshop. Those papers focused on the issues of remote sensing and telecommunications and addressed either institutional or commercial examples of space research, development or application that could serve as models for initiating space activities in developing countries.

13. The presentations were mainly well-developed case-studies with goal-orientated results in various developing countries. The need for cooperation among developing countries was emphasized, particularly to help those countries to overcome the high preliminary costs for initiating space activities.

14. It was noted that financial considerations often limited developing countries in the exploitation of space technology for needed socio-economic development programmes. Significant costs included the initial investment for technology acquisition, the purchase of data on a regular basis and research to develop methodologies for the specific needs of individual countries.

15. The need for modern equipment and facilities was stressed. It was emphasized that the provision of user-friendly hardware and software modules to developing countries for the study of the environment and natural resources would be very beneficial.

16. Efforts should be made to reduce the cost of Earth observation data to developing countries. Developed countries should continue to support the developing countries by establishing flexible pricing systems, taking into account the requirements of the individual recipient country.

17. Presentations recommended that the common interests of countries should be pursued through regional associations and by the encouragement of bilateral contacts and agreements. Scientists, engineers and technicians from developing countries should be involved in the space telecommunications applications research of developed countries whenever possible.

18. Case-studies revealed the cooperation between developed and developing countries and its improvement by using the existing knowledge in the developing country. Considerable improvements could be made by including subcontractors from the developing countries and by including a commitment to long-term follow-up and training.

19. There was also a continued need for training, education and information on applications of space technology for developing countries, especially in the fields of remote sensing and telecommunications. Training was needed for a number of individuals at the secondary school and university levels. The establishment of regional training centres in developing countries would enable neighbouring countries to share costs while providing training under realistic circumstances with locally available equipment and infrastructure.

Annex

44th INTERNATIONAL ASTRONAUTICAL CONGRESS

GRAZ, AUSTRIA, 16 TO 22 OCTOBER 1993 *

UN/IAF WORKSHOP ON "ORGANIZING SPACE ACTIVITIES IN DEVELOPING COUNTRIES: RESOURCES AND MECHANISMS"

Co-sponsored by ESA and CEC and hosted by ASA on behalf of the Government of Austria

The United Nations, the International Astronautical Federation (IAF), the Austrian Space Agency (ASA) on behalf of the Government of Austria, the European Space Agency (ESA), the Commission of the European Community (CEC) have agreed to jointly organize a Workshop on "Organizing Space Activities in Developing Countries: Resources and Mechanisms". The Workshop will specifically address institutional and commercial examples of space research, development or application, that could serve as models for initiating space activities in developing countries.

This Workshop is a follow up to similar workshops held in cooperation with the IAF Congress in Montreal (October 1991) and the World Space Congress in Washington, DC (August 1992). It will review recommendations made at previous workshops and address, within the central topics of (a) Environmental and Resource Management and (b) Space Communication for Development, the technological needs and the resources and mechanisms through which the developing countries can initiate or strengthen their own space related activities. The Workshop will provide a general blue-print on how developing countries on their own or through cooperative ventures, can establish cost effective industrial or institutional enterprises in adequately selected fields of space science and technology.

HONORARY CHAIRMEN:
H.E. Dr. P. Hohenfellner (Chairman of UN/COPUOS)
H.E. Dr. P. Jankowitsch (Former Chairman of UN/COPUOS)
Prof. W. Riedler (Technical University Graz)

CO-CHAIRMEN OF THE PROGRAM COMMITTEE:
N. Jasentuliyana (UN)
J. Ortner (ASA)
U.R. Rao (IAF/CLIODN)

MEMBERS OF THE PROGRAM COMMITTEE:
J. Arets (ESA)
S. Camacho (UN/OOSA)
N.G. Chandrasekhar (IAF)
M. Gerard (AIAA)
A. Ghazi (CEC)
J. Hess (IAF)

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Friday, 15 October 1993, Room B

08:30-9:00	Registration	
	Chairman: P. Hohenfellner (Austria)	
09:00-09:40	Opening Ceremony	
	Opening Statements	N. Jasentuliyana (UN) J. Ortner (ASA)
	Welcoming Statements	A. Stingl (Mayor of Graz) J. Krainer (Governor of Styria)
09:40-10:10	Keynote Address: "Managing Space Activities for Economic and Social Development"	P. Jankowitsch (Austria)
10:10-10:40	Theme Address: "Role of Space Applications in Developing Countries"	S. Mehmud (Pakistan)
10:40-10:50	Coffee Break	
10:50-11:20	Establishing the Organizational and Institutional Infrastructure for a National Space Program	U.R. Rao (India) (IAF,CLIODN)
11:20-11:40	Space Resources and Mechanisms for Developing Countries - View of the CEC	J.P. Contzen (CEC)
11:40-12:00	Establishing Adequate Mechanisms in Europe for Financing Remote Sensing Activities in Developing Countries	J. Arets (ESA)
12:00-12:30	Discussion	
12:30-14:00	Lunch	
	Chairman: R. Gerold (CEC)	
14:00-14:30	Terrestrial versus Satellite Communications	W. Riedler (Austria)
14:30-15:00	Improving Regional Health Care in Africa Using Current Space Systems and Technology	M. Jemison (Astronaut, USA)
15:00-15:40	Discussion	
15:40-15:50	Coffee Break	
15:50-16:20	Towards Global Environmental Legislation	P. Malanczuk (Netherlands)
16:20-16:50	Space Education and Training: A Different Approach	S. Camacho (UN)
16:50-17:30	Discussion	
19:30	Reception by the Mayor of the City of Graz, City Hall	

Saturday, 16 October 1993, Room D

Environmental and Resource Management

Chairmen: M. Abdel-Hady (Egypt)
R. Gibson (UK)

09:00-09:30	Environmental and Earth Resource Monitoring in Developing Countries	A. Ghazi (CEC)
09:30-10:00	Radar Data and Environmental Protection	G. Duchossois (ESA)
10:00-10:40	Discussion	
10:40-10:50	Coffee Break	
10:50-11:20	Global Satellite Project and First Results	L. Beckel (Austria)
11:20-11:50	Remote Sensing for National Development: Implementing Results Achieved in the National Indian Satellite Program	S. Jayaraman (India)
11:50-12:30	Discussion	
12:30-14:00	Lunch	
14:00-14:30	Establishing a Center of Excellence for Geographical Information Systems	C. Duarte (Mexico)
14:30-15:00	Case Studies for Managing Water Resources in the Sahel Areas	P. Brivio (Italy)
15:00-15:40	Discussion	
15:40-15:50	Coffee Break	
15:50-16:20	Operational Detection of Fires Endangering the Amazon Forests	A. Setzer (Brasil)
16:20-16:50	Geographic Information - A Necessity for the Developing World	N. Kabbaj (Morocco)
16:50-17:30	Discussion	
17:30-17:40	Coffee Break	
17:40-18:15	General Discussion and Preparation of Draft Recommendations	
19.30	Reception by the Austrian Federal Minister for Foreign Affairs Palais Attems, Sackstraße	

Saturday, 16 October, 1993, Room K

Space Communications for Development

Chairmen: R. Collette (ESA)
E. Mendez (Mexico)

09:00-09:30	Developing Countries and Trends in Telecommunications Services towards the 21st Century	L. Pap (Hungary)
09:30-10:00	Case Study of a Telecommunication Project Carried out on the Cape Verde Islands	H. Livramento (Cape Verde Islands)
10:00-10:40	Discussion	
10:40-10:50	Coffee Break	
10:50-11:20	Case Study of a Telecommunication Project Carried out in China	C. Huisheng (China)
11:20-11:50	Personal Satellite Communication Systems and their Role for Third World Countries	D. Wright (INMARSAT)
11:50-12:30	Discussion	
12:30-14:00	Lunch	
14:00-14:30	The Role of Satellites for Social and Educational Programs	B. Hidayat (Indonesia)
14:30-15:40	Discussion	
15:40-15:50	Coffee Break	
15:50-16:20	Introducing and Establishing the VSAT Technology in Thailand	W.Suttipak (Thailand)
16:20-16:50	New Services for Rural and Remote Area Communications in CIS Countries	A. Bernstain (Mariga Communications)
16:50-17:30	Discussion	
17:30-17:40	Coffee Break	
17:40-18:15	General Discussion and Preparation of Draft Recommendations	
19:30	Reception by the Austrian Federal Minister for Foreign Affairs Palais Attems, Sackstraße	

Sunday, 17 October 1993, Room B

Chairmen: R. Gibson (UK)
U.R. Rao (India)

09:00-09:20	Improving Rural Telecommunication Facilities in Africa	H. Mayerhoff (ITU)
09:20-09:40	Satellite Technology for Sustainable Development	S. Wittgenstein (CCRS)
09:40-10:00	Being Prepared for Operational Remote Sensing: Earth Environment	W. Steinborn (DARA)
10:00-10:20	Coffee Break	
10:20-12:30	General Discussion	
12:30-13:00	Closing Ceremony and Adoption of Report	